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control power of the input signal light.

30. (New) A method as in claim 19, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.

31. (New) A method as in claim 20, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.

REMARKS

I. STATUS OF CLAIMS

Claims 1 and 7-9 have been amended herein and claims 27-31 have been added herein. Therefore, it is respectfully submitted that claims 1, 2, and 7-31 are currently pending, of which claims 1, 2, 7-10, 13 and 16-31 are under consideration.

II. REJECTION OF CLAIMS 1-2, 7-10, 13, 16, 19 AND 25 UNDER 35 U.S.C. § 102 AS ANTICIPATED BY WATANABE

In the Office Action at pages 2-3, the Examiner rejected claims 1-2, 7-10, 13, 16, 19 and 25 under 35 U.S.C. § 102(a) as anticipated by Watanabe (U.S. Publication No. 2001/0021288).

Watanabe was filed on February 15, 2001, and published on September 13, 2001. Applicant's Application claims priority to Japanese Application Number 2000-201984, which was filed on July 4, 2000. Thus, Watanabe cannot be an anticipating reference. Attached is a verified English translation of Japanese Application Number 2000-201984 submitted with this Amendment.

In view of the above, it is respectfully submitted that the rejection is overcome.

Applicant notes that the only rejection to claims 10 and claim 13 were based on Watanabe. Therefore, with Watanabe eliminated, Applicant submits that **claims 10 and 13 should be allowed**.

III. REJECTION OF CLAIMS 1-9, 16-20, and 23-26 UNDER 35 U.S.C. § 102 AS ANTICIPATED BY HANSEN

In the Office Action at page 3, the Examiner rejected claims 1-9, 16-20, and 23-26 under 35 U.S.C. § 102 as anticipated by Hansen (U.S. Patent No. 6,323,993). Claims 3-6 were previously cancelled and thus will not be addressed. The Examiner stated that Hansen, at col. 3, discloses the elements of Applicant's invention.

Applicant's amended claim 1 recites a method that includes controlling the power of said input signal light so that a quality measurement of an output signal light is improved to an optimal level. The selected quality measure to obtain the quality measurement is one of a Q factor, a bit error rate, a spectrum shape, and an eye opening.

Hansen describes the benefits of remote, distributed amplifiers over more conventional amplifiers located at the source. In describing the method, Hansen mentions that a quality measure can be used to compare the noise levels caused by boosting power at the input versus boosting power remotely along the transmission route. Hansen at col. 3, line 60 to col. 4 line 12. However, Hansen does not describe controlling the power of an input signal light so that a quality measurement of an output signal light is improved to an optimal level. Moreover, Hansen does not describe selecting a quality measure that obtains a quality measurement of said output signal light from one of a Q factor, a bit error rate, a spectrum shape, and an eye opening, as recited in independent claim 1. It is respectfully requested that claim 1, and claims 2, 16, and 27, which depend from claim 1, be allowed.

Independent claim 7 recites a device that includes a power controller controlling the power of an input signal light so that a quality measurement of an output signal light is improved to an optimal level with somewhat similar language to Independent claim 1. For the reasons above with respect to claim 1, it is respectfully requested that claim 7, and claims 8-9, which depend from claim 7, be allowed.

Independent claims 17-20 and 23-26 recite methods and means of controlling power of an input signal light by optimizing an output signal light's Q factor, bit error rate, spectrum shape, or eye opening, respectively, somewhat similar to claim 1. For the reasons above with respect to claim 1, it is respectfully requested that claims 17-20 and 28-31, which depend from claims 17-20, respectively, and claims 23-26 be allowed.

IV. REJECTION OF CLAIMS 21-22 UNDER 35 USC § 103 AS OBVIOUS OVER OTTERBACH

In the Office Action at pages 3-4, the Examiner rejected claims 21-22 under 35 U.S.C. § 103 as obvious over Otterbach (US Patent No. 6,323,993). In making the rejection, the Examiner recognized that Otterbach does not disclose an amplifier that amplifies a first signal to produce a second signal. However, the Examiner referenced fig. 1 and col. 2, lines 45-50 in contending that Otterbach teaches intermediate amplifiers in which the optical signals are amplified.

Independent claims 21 and 22 recite changing a power level of a second signal to optimize a measured quality of a fourth signal. The second signal is attenuated to produce a third signal, which is shaped to produce the fourth signal.

In contrast, Otterbach describes an amplification device situated along a fibre span to allow a reduction in input power and thereby decrease nonlinear effects. Otterbach at col. 3, lines 20-29. The prior art referenced in figure 1 describes repeaters along a long-haul transmission line that terminate, within the repeater, by an optical amplifier. Thus, Otterbach does not describe or suggest changing a power level of a second signal to optimize a measured quality of a fourth signal.

It is respectfully requested that the rejection to claims 21 and 22 be withdrawn.

V. CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: April 28, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND the following claims:

1. (Currently amended) A method comprising:

shaping a waveform of an input signal light to produce a shaped output signal light;

selecting a quality measure that obtains a quality measurement of said output signal light from one of:

a Q factor;

a bit error rate;

a spectrum shape; [or]<u>and</u>

an eye opening; and

controlling the power of said input signal light so that said quality measurement is improved<u> to an optimal level</u>.

2. (Previously amended) A method according to claim 1, wherein said controlling comprises providing an optical amplifier amplifying said input signal light, and adjusting the gain of said optical amplifier.

7. (Currently amended) A device comprising:

a waveform shaper shaping a waveform of an input signal light to produce a shaped output signal light;

a quality selection module that obtains a quality measurement of said output signal light from one of:

a Q factor;

a bit error rate;

a spectrum shape; [or]<u>and</u>

an eye opening; and

a power controller controlling the power of said input signal light so that said quality measurement is improved <u>to an optimal level</u>.

8. (Currently amended) A device according to claim 7, wherein said power controller

comprises an optical amplifier amplifying said input signal light and a controller adjusting the gain of said optical amplifier so that said quality measurement is most improved <u>to the optimal level</u>.

9. (Currently amended) A device according to claim 7, wherein said power controller comprises an optical amplifier amplifying said input signal light, an optical attenuator attenuating an output from said optical amplifier, and a controller adjusting the attenuation of said optical attenuator so that said quality measurement is most improved <u>to the optimal level</u>.

10. (Original) A method comprising:

providing a waveform shaper having a variable threshold for waveform shaping input signal light according to said variable threshold and outputting output signal light;

measuring the quality of said output signal light; and

controlling said variable threshold so that said quality measure is improved.

11. (Withdrawn) A method according to claim 10, wherein:

said waveform shaper comprises a semiconductor optical amplifier; and

said controlling step comprises the step of adjusting an injection current to be supplied to said semiconductor optical amplifier.

12. (Withdrawn) A method according to claim 10, wherein:

said waveform shaper comprises a distributed feedback laser diode adapted to change said variable threshold according to the power of assist light supplied thereto; and

said controlling step comprises the step of adjusting the power of said assist light.

13. (Original) A device comprising:

a waveform shaper having a variable threshold for waveform shaping input signal light according to said variable threshold and outputting output signal light;

means for measuring the quality of said output signal light; and

a controller for controlling said variable threshold so that said quality measured is improved.

14. (Withdrawn) A device according to claim 13, wherein:

said waveform shaper comprises a semiconductor optical amplifier; and

said controller adjusts an injection current to be supplied to said semiconductor optical amplifier.

15. (Withdrawn) A device according to claim 13, wherein:

said waveform shaper comprises a distributed feedback laser diode adapted to change said variable threshold according to the power of assist light supplied thereto, and a light source for outputting said assist light; and

said controller adjusts the power of said assist light.

16. (Previously added) The method of claim 1, wherein the input signal is a wavelength division multiplexed signal.

17. (Previously added) A method comprising:

shaping a waveform of an input signal light to produce a shaped output signal light;

measuring a Q factor of said output signal light; and

controlling the power of said input signal light to optimize the measured Q factor.

18. (Previously added) A method comprising:

shaping a waveform of an input signal light to produce a shaped output signal light;

measuring a bit error rate of said output signal light; and

controlling the power of said input signal light to optimize the measured bit error rate.

19. (Previously added) A method comprising:

shaping a waveform of an input signal light to produce a shaped output signal light;

measuring a spectrum shape of said output signal light; and

controlling the power of said input signal light to optimize the measured spectrum shape.

20. (Previously added) A method comprising:

producing a shaped output signal from an input signal;

measuring an eye opening of said output signal light; and

controlling the power of said input signal light to optimize the measured eye opening.

21. (Previously added) An optical repeater comprising:

an amplifier that amplifies a first signal to produce a second signal;

an attenuator that attenuates the second signal to produce a third signal;

an optical regenerator that shapes a waveform of the third signal to produce a fourth signal;

a quality monitor that measures a quality of the fourth signal; and

a controller that controls the attenuator to change a power level of the second signal and thereby optimize the measured quality of the fourth signal.

22. (Previously added) A device comprising:

means for amplifying a first signal to produce a second signal;

means for attenuating the second signal to produce a third signal;

means for shaping a waveform of the third signal to produce a fourth signal;

means for monitoring a quality of the fourth signal; and

means for controlling the attenuation to change a power level of the second signal and thereby optimize the quality measure of the fourth signal.

23. (Previously added) An apparatus comprising:

means for shaping a waveform of an input signal light to produce a shaped output signal light;

means for measuring a Q factor of said output signal light; and

means for controlling the power of said input signal light to optimize the measured Q factor.

24. (Previously added) An apparatus comprising:

means for shaping a waveform of an input signal light to produce a shaped output signal light;

means for measuring a bit error rate of said output signal light; and

means for controlling the power of said input signal light to optimize the measured bit error rate.

25. (Previously added) A method comprising:

means for shaping a waveform of an input signal light to produce a shaped output signal light;

means for measuring a spectrum shape of said output signal light; and

means for controlling the power of said input signal light to optimize the measured spectrum shape.

26. (Previously added) A method comprising:

means for producing a shaped output signal light from an input signal light;

means for measuring an eye opening of said output signal light; and

means for controlling the power of said input signal light to optimize the measured eye opening.

Please ADD the following claims:

27. (New) A method as in claim 1, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.

28. (New) A method as in claim 17, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.

29. (New) A method as in claim 18, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.

30. (New) A method as in claim 19, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.

31. (New) A method as in claim 20, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control power of the input signal light.